

This cross-sectional view shows a semiconductor device with a trench isolation structure. The device includes a substrate (10) with a trench (12) filled with an isolation material (14). A layer (16) is deposited over the trench and the substrate. A patterned layer (20) is formed on top of the layer (16). A trench (22) is formed in the patterned layer (20). A layer (24) is deposited in the trench (22). A layer (26) is deposited over the patterned layer (20). A layer (28) is deposited over the layer (26). A layer (30) is deposited over the layer (28). The trench (22) is filled with a material (24) that is different from the isolation material (14). The layer (24) is a conductive material, and the layer (26) is an insulating material. The layer (28) is a conductive material, and the layer (30) is an insulating material. The trench (22) is a narrow trench, and the layer (24) is a thin layer. The layer (26) is a thick layer, and the layer (28) is a thin layer. The layer (30) is a thick layer. The trench (22) is a narrow trench, and the layer (24) is a thin layer. The layer (26) is a thick layer, and the layer (28) is a thin layer. The layer (30) is a thick layer.

FIG. 3

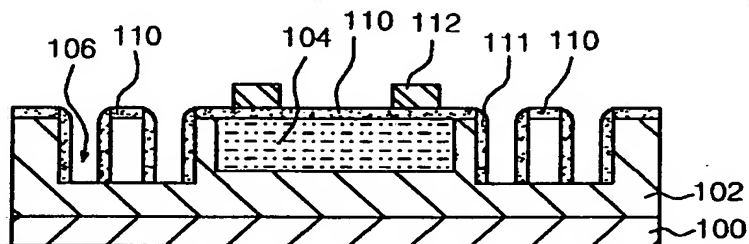


FIG. 4

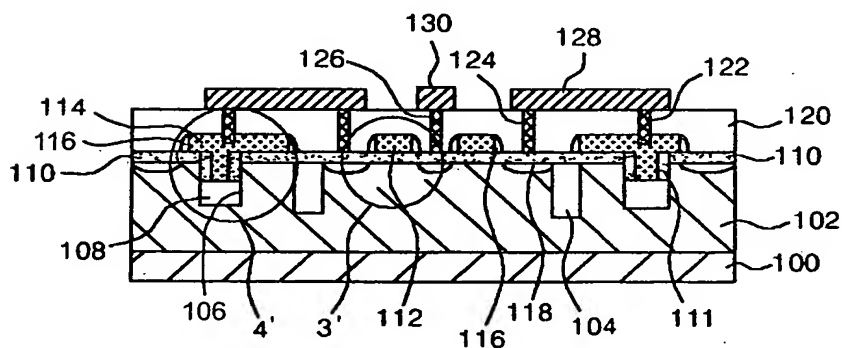


FIG. 5A

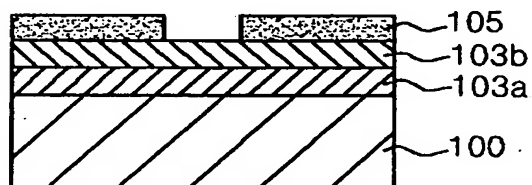


FIG. 5B

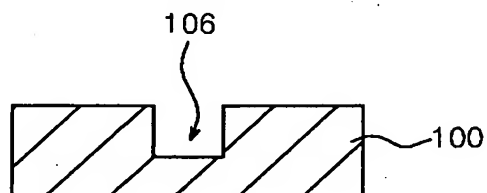


FIG. 5C

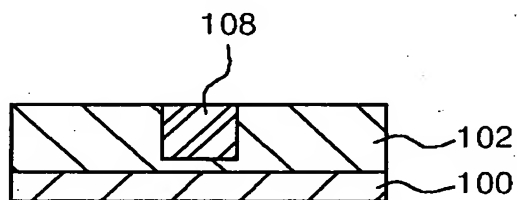


FIG. 5D

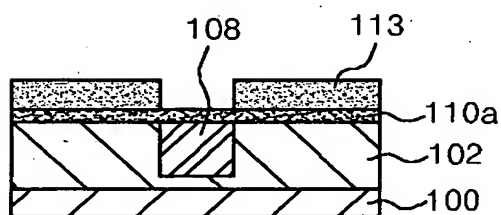


FIG. 5E

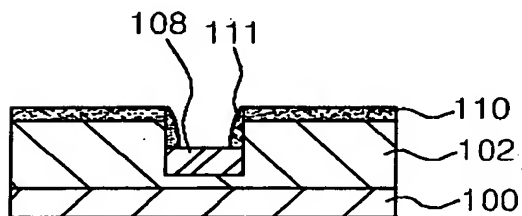


FIG. 5F

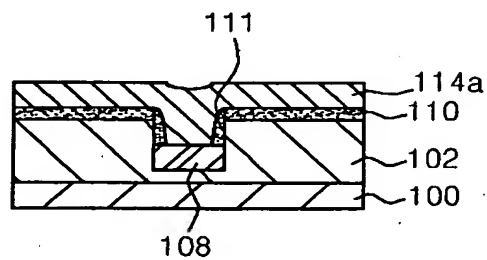


FIG. 5G

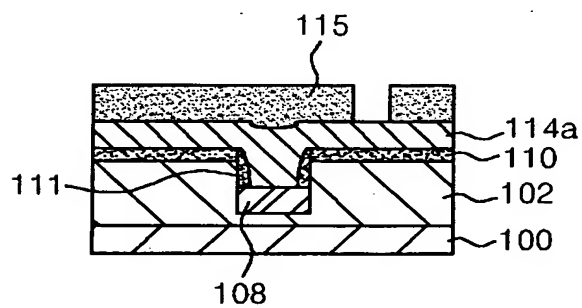


FIG. 5H

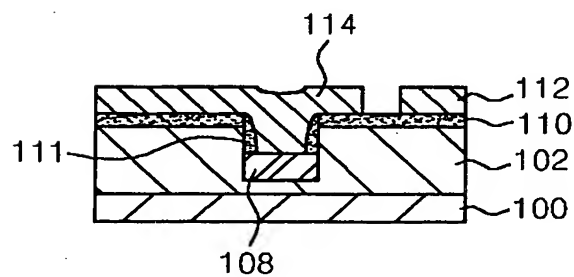


FIG. 5I

